WHAT IS CLAIMED IS:

1. A method for brain wave fluctuations analysis with computer technique comprising

dividing brain wave signals into subsections with a predefined length of time, analyzing a power spectrum of said each subsection to select a biggest power amplitude within 0.5-50Hz, analyzing the power spectrum and a frequency spectrum to get fluctuations of the power spectrum within a supra-slow frequency, and analyzing the fluctuations to get a series of parameters which are presented in form of data, graphs and curves, wherein

the analyzing step includes at least a conventional analysis on the power spectrum including

（1） analyzing the power spectrum of the brain wave signals in a predefined time interval, to carry out Fourier Transformation to a observation data $x_N(n)$ from N spots of a brain wave $x(n)$, with a result of $X_N(e^{j\omega})$;

（2） making a square of an amplitude of said result, which is then divided by N to be an estimate value of a real power spectrum $P(e^{j\omega})$ of $x(n)$, the power spectrum estimated with cyclogram being expressed as $P(e^{j\omega}) = \frac{1}{N}|X_N(\omega)|^2$;

（3） calculating $X_N(\omega)$ by fast Fourier Transformation $X_N(k) = \sum_{n=0}^{N-1} x(n) W_N{}^{nk}, k = 0,1,\ldots,N-1, W_N = e^{-j\frac{2\pi}{N}}$, and calculating the power spectrum by

$$P(k)=\frac{1}{N}|X_N(k)|^2.$$

2. The method according to claim 1, further comprising analyzing power fluctuations of the brain wave signals including

（1） selecting a window function that has a small side lobe amplitude and a fast attenuation, expressed by $\omega(n)=0.5-0.5\cos(\frac{2\pi n}{N}), n=0,1,...N-1.$, and cutting the brain wave signal $x(n)$ getting a signal of $x_N(n)=x(n)\omega(n)$;

（2） analyzing a power spectrum of the signal $x_N(n)=x(n)\omega(n)$ with a sampling time of T seconds, calculating FFT to get a frequency spectrum with a frequency-domain distinguish ability of 1/T, and selecting a power amplitude P with a biggest energy and a respective frequency f;

（3） dividing the time domain brain wave signal having a total time length of N seconds into subsections by an interval of T seconds in time sequence, carrying out said conventional analysis on the power spectrum and signal analysis on brain wave power fluctuations for N/T data sections to get a fluctuation signal p(n) with a biggest power amplitude and a corresponding frequency fluctuation signals f(n), n=1.....n， n=N/T.

3. The method according to claim 2, further comprising analyzing on the fluctuations of brain wave including

（1） analyzing the fluctuation signals p(n) of the biggest power amplitude within the length of n spots;

(2) multiplying with a Hanning window with a length of n, then carrying out analysis on power spectrum, in which a frequency domain resolution is 1/N Hz due to a unit of the time length of N-second, and obtaining a diagram of the fluctuations of brain wave form lines within a certain frequencies in an analysis result of the power spectrum;

(3) under conditions that a total sampling time is more than N seconds, dividing the same into subsections with N seconds as a unit and then carrying out the conventional power spectrum analysis, analysis on the fluctuation signals of brain wave power and fluctuations of the brain wave to each subsection.

4. The method according to claim 3, further comprising analyzing on S pedigree including steps of

(1) finding out several optimal lines D1-Dn with biggest amplitudes from the fluctuations of brain wave of each lead and arranging them from big to small, getting a S pedigree of a single lead data that has n values;

(2) obtaining N*n optimal lines in combination of N leads and adding in all the optimal lines with a same frequency to get the S pedigree;

(3) under conditions that a total sampling time is longer than N seconds, dividing into subsections with N seconds as a unit, and then carrying out analyses on the conventional power spectrum, analysis on fluctuations of brain wave power, analysis on fluctuations of brain wave and analysis on S pedigree to each subsection, and making out the curve using each analytical result as a vertical axis and time as a horizontal axis.

5. The method according to claim 1, wherein the sampling routes of brain wave signals include using any lead or lead combination.

6. The method according to claim 5, wherein sampling of the brain wave signals accords with the international standard lead system-12 lead and the electrodes are located in F3、F4、C3、C4、P3、P4、O1、O2、F7、F8、T5、T6.

7. The method according to claim 2, further comprising a second level analysis on the basis of the analysis on the fluctuation signals of brain wave power-one or two analysis methods of entropy calculation and single-frequency competition, wherein said entropy calculation includes the following steps:

（1） calculating entropy according to $H = -\sum_{k=8}^{13} p_k \lg_2 p_k$, in which p_k is the probability of each frequency in the brain wave;

（2） calculating a total entropy from the probability distribution of N lead （total is n*N）;

adding in all the changing process of the same optimal frequencies along with time in the frequency fluctuations f(n) of brain wave fluctuation signals so as to get the probability curve of the optimal frequency.

8. The method according to claim 4, further comprising analyzing on any one

item or one combination of the second level 21 items on the basis of analysis on S pedigree, the 21 items including (3)analysis on the score of S pedigree, (4)analysis on fundamental pedigree, (5)analysis on optical value, (6) reversion of A/P; analysis on L/R unbalance, (7)analysis on special frequency, (8)analysis on different frequency, (9)analysis on continuum frequency, (10)analysis on optimal frequency, (11) analysis on space distribution of S pedigree power, (12)power of single-frequency and distribution of its corresponding value （L/R）, (13)analysis on the distribution of mean power, (14)analysis on the relative value A/P and L/R of power, (15)analysis on the curve of long temporal S pedigree, (16)analysis on the curve of long temporal optical lines, (17)analysis on the curve of long temporal fundamental pedigree, (18)analysis on the curve of long temporal space distribution of power, (19)analysis on the curve of long temporal entropy, (20)analysis on the curve of long temporal special frequency, （21） analysis on the curve of long temporal continuum frequency, （22） analysis on the curve of long temporal space distribution of fundamental pedigree, （23） analysis on the curve of long temporal conventional power spectrum, wherein

the analysis method of the said (3) analysis on the score of S pedigree is to present the data of the score of S pedigree during S pedigree analysis with graphs;

the analysis method of the said (4) analysis on the fundamental pedigree is to analyze statistically on the S pedigree corresponding to the fundamental frequency in S pedigree, and add in the double periodic frequency from 3 mHz (if 3mHz is statistic, the value of 6mHz, 9mHz and etc. should also be added), and meanwhile divide all the leads

into front-to-rear and left-to-right subsections for statistic according to their positions in the above;

the analysis method of the said (5) analysis on the optimal value is to present the optimal power value and its corresponding frequency according to the space distribution of the lead;

the analysis method of the said (6) reversion of A/P; analysis on L/R unbalance is to calculate the front-to-rear ratio A/P of the power value of each frequency according to the space distribution of the lead and then present the frequencies whose A/P values are bigger than a limit and calculate the left-to-right ratio L/R and present the frequencies whose L/R values are bigger than a limit;

the analysis method of the said four items of (7)analysis on special frequency, (8)analysis on different frequency, (9)analysis on continuum frequency, (10)analysis on optimal frequency is to present the special frequency, different frequency, continuum frequency and optimal frequency of each lead according to the space distribution of the lead;

the analysis method of the said (11)analysis on space distribution of S pedigree power is to arrange all the power values of each line in the brain wave fluctuations according to their space lead positions, open the window in the display interface in the form of "sub-interface in interface" to select the lines, and show respective power values for the selected lines in each lead according to a respective space distribution;

the analysis method of the said (12) power of single-frequency and distribution of

its corresponding value(L/R)is to add in all the power values corresponding to the optimal lines D1-Dn of each lead so as get the total power value of each lead, then present the power value of the fundamental frequency and the left-to-right ratio (L/R） which is bigger or smaller than the limited value according to the space distribution of the lead;

the analysis method of the said ⑬analysis on the distribution of mean power is to present the mean power value of each lead according to its space distribution;

the analysis method of the said ⑭analysis on the relative value A/P and L/R of power is to calculate the front-to-rear and left-to-right ratio of the power value according to its space distribution;

the analysis method of the said ⑮analysis on the curve of long temporal S pedigree is to open a window in the display interface in the form of "sub-interface in interface" for lines or pedigree selection, using fluctuation value of each pedigree or each line in each or all leads as vertical axis and time as horizontal axis;

the analysis method of the said ⑯analysis on the curve of long temporal optical lines is to open a window in the display interface in the form of "sub-interface in interface" for arrangement selection of optimal lines (D1-Dn), using the frequency of the lines within the optimal line zone as the vertical axis and time as horizontal axis;

the analysis method of the said ⑰analysis on the curve of long temporal fundamental pedigree is to open a window in the display interface in the form of "sub-interface in interface" for pedigree selection, using the fluctuation values in each time interval of the fundamental pedigree of all leads or each lead as vertical axis and time

as horizontal axis;

the analysis method of the said ⑱analysis on the curve of long temporal space distribution of power is to open a window in the display interface in the form of "sub-interface in interface" for line selection, using the power value of each line in each lead as vertical axis and time as horizontal axis;

the analysis method of the said ⑲analysis on the curve of long temporal entropy is to work out a curve using entropy of all leads or each lead as vertical axis and time as horizontal axis to present the changes of entropy along with time;

the analysis method of the said ⑳analysis on the curve of long temporal special frequency is to work out a curve using the number of special frequencies in each or all leads as vertical axis and time as horizontal axis so as to observe the changes of special frequency along with time;

the analysis method of the said (21) analysis on the curve of long temporal continuum frequency is to make out a curve using the number of continuum frequencies in each or all leads as vertical axis and time as horizontal axis so as to observe the changes of continuum frequency along with time;

the analysis method of the said (22) analysis on the curve of long temporal space distribution of fundamental pedigree is to open a window in the display interface in the form of "sub-interface in interface" for pedigree selection, using power value which is read from the single-frequency power and the distribution of its corresponding value (L/R) as vertical axis and time as horizontal axis;

the analysis method of the said (23) analysis on the curve of long temporal conventional power spectrum is to make out n dynamic curves, separately using power values of the corresponding frequencies D1-Dn which arranged from big to small and selected from the conventional power spectrum by their biggest amplitudes selecting as vertical axis and time as horizontal axis.

9. The method according to claim 8, further comprising (24) analysis on long temporal event mark including distinguishing the event mark signals recorded in the brain wave recorder, back playing these signals in the brain wave signals and presenting them in the corresponding positions in the time axis of various dynamic curves, said (24) analysis combined with any one or more items of the following nine items, including ⑮analysis on the curve of long temporal S pedigree, ⑯analysis on the curve of long temporal optical lines, ⑰analysis on the curve of long temporal fundamental pedigree, ⑱analysis on the curve of long temporal space distribution of power, ⑲analysis on the curve of long temporal entropy, ⑳analysis on the curve of long temporal special frequency, (21) analysis on the curve of long temporal continuum frequency, (22) analysis on the curve of long temporal space distribution of fundamental pedigree, (23) analysis on the curve of long temporal conventional power spectrum.

10. The method according to any of claims 1、2、3、4、7、8、9, wherein the said analysis method can be used to treat the brain wave signals sampled in any one or

more lead combination and can transmit the result in one or more leads combination selected in the analysis result to the terminal processor for display, print or storage.

11. An apparatus for brain wave fluctuation signal analysis comprising a plurality of electrodes, a digital brain wave signal amplifier or a brain wave recorder, a PC, a data processor and a terminal processor that are connected in sequence, wherein

the electrodes are used to sample the brain wave signals which are transmitted to the digital brain wave signal amplifier and/or brain wave recorder for acceptance, amplification, digital/analog conversion, digital filter or/and data storage, data in the digital brain wave signal amplifier and/or brain wave recorder is upper transmitted to PC to be treated and fluctuation analyzed with the connected data processor and the analytical result is transmitted to the terminal processor for storage, display or print.

12. The apparatus according to claim 11, wherein the said data processor includes analysis module on conventional power spectrum and it is used to analyze the power spectrum of the time domain brain wave signals with given length of time so as to get the power spectrum which is expressed as $P(k) = \frac{1}{N}|X_N(k)|^2$.

13. The apparatus according to claim 12, wherein the said data processor also includes analysis module on fluctuation signals of brain wave and it is used to select window function with small side lobe amplitude and fast attenuation, which is expressed

as $\omega(n) = 0.5 - 0.5\cos(\frac{2\pi n}{N}), n = 0,1,...N-1.$ to cut the brain wave signal $x(n)$ and get $x_N(n) = x(n)\omega(n)$, analyze the power spectrum of the above signal $x_N(n) = x(n)\omega(n)$ with the sampling time of T seconds, by FFT calculation, the frequency-domain resolution of the frequency spectrum is 1/T, and wherein select the power amplitude P with the biggest energy and its corresponding frequency f and divide the time domain brain wave signal with the total time length of N seconds into subsections with the interval of T seconds in time sequence, then carry out the said conventional power analysis and signal analysis on brain wave power fluctuations in order to get the fluctuation signal p(n) with the biggest power amplitude and its corresponding frequency fluctuation signals f(n),n=1.....n, n=N/T.

14. The apparatus according to claim 13, wherein the said data processor also includes an analysis module on fluctuations of brain wave and it is used to analyze the fluctuation signals p(n) of the biggest power amplitude within the length of n spots, multiply it with Hanning window with the length of n and then carry out analysis on power spectrum, wherein a frequency domain resolution is 1/N Hz, since the unit of the time length is N-second, and the lines within a certain frequencies in the analysis result of the power spectrum form the fluctuations of brain wave and if the whole sampling time is more than N second, divide it into subsection with N seconds as the unit and then carry out the said conventional power spectrum analysis, analysis on the fluctuation signals of brain wave power and fluctuations of the brain wave to each subsection.

15. The apparatus according to claim 11, wherein the said data processor also includes analysis module on S pedigree and it is used to find out several optimal lines D1-Dn with the biggest amplitude from the fluctuations of brain wave of each lead and arrange them from big to small, in this way, it can get S pedigree with single lead data, and there are n values and get N*n optimal lines in N lead, add in all the optimal lines with the same frequency so as to get the S pedigree.

16. The apparatus according to claim 13, wherein data the said from the said analysis module on fluctuation signals of brain wave power is transmitted to the analysis module on entropy calculation and/or analysis module on single-frequency competition, wherein

the said analysis module on entropy calculation is used to calculate entropy according to $H = -\sum_{k=8}^{13} p_k \lg_2 p_k$, and then by the distribution of the probability distribution of N leads, the total entropy can be calculated;

the said analysis module on single-frequency competition is used to add in the changing process of the same optimal frequency number along with time in frequency fluctuations f(n) in fluctuation signals of brain wave so as to get the optimal frequency probability curve.

17. The apparatus according to claim 15, wherein the data from the said

analysis module on S pedigree is transmitted to any one or more of the following 21 modules in the second level, said 21 modules are (3)analysis on the score of S pedigree, (4)analysis on fundamental pedigree, (5)analysis on optical value, (6) reversion of A/P; analysis on L/R unbalance, (7)analysis on special frequency, (8)analysis on different frequency, (9)analysis on continuum frequency, (10)analysis on optimal frequency, (11) analysis on space distribution of S pedigree power, (12)power of single-frequency and distribution of its corresponding value(L/R), (13)analysis on the distribution of mean power, (14)analysis on the relative value A/P and L/R of power, (15)analysis on the curve of long temporal S pedigree, (16)analysis on the curve of long temporal optical lines, (17)analysis on the curve of long temporal fundamental pedigree, (18)analysis on the curve of long temporal space distribution of power, (19)analysis on the curve of long temporal entropy, (20)analysis on the curve of long temporal special frequency, （21） analysis on the curve of long temporal continuum frequency, （22） analysis on the curve of long temporal space distribution of fundamental pedigree, （23） analysis on the curve of long temporal conventional power spectrum, wherein

the analysis module of the said (3) analysis on the score of S pedigree is to present the data of the score of S pedigree during S pedigree analysis with graphs;

the analysis module of the said (4) analysis on the fundamental pedigree is to analyze statistically on the S pedigree corresponding to the fundamental frequency in S pedigree, add in the double periodic frequency from 3 mHz (if 3mHz is statistic, the value of 6mHz, 9mHz and etc. should also be added) and meanwhile, divide all the leads into

front-to-rear and left-to-right subsections for statistic according to their positions in the above;

the analysis module of the said (5) analysis on the optimal value is to present D1-Dn optimal power value and its corresponding frequency according to the space distribution of the lead;

the analysis module of the said (6) reversion of A/P; analysis on L/R unbalance is to calculate the front-to-rear ratio A/P of the power value of each frequency according to the space distribution of the lead and then present the frequencies whose A/P values are bigger than a limit and meanwhile, calculate the left-to-right ratio L/R and present the frequencies whose L/R values are bigger than a limit;

the analysis module of the said four items of (7)analysis on special frequency, (8)analysis on different frequency, (9)analysis on continuum frequency, (10)analysis on optimal frequency is to present the special frequency, different frequency, continuum frequency and optimal frequency of each lead according to the space distribution of the lead;

the analysis module of the said (11)analysis on space distribution of S pedigree power is to arrange all the power values of each line in the brain wave fluctuations according to their space lead positions, open the window in the display interface in the form of "sub-interface in interface" to select the lines, and show their power values for the selected ones in each lead according to its space distribution;

the analysis module of the said (12) power of single-frequency and distribution of

its corresponding value(L/R)is to add in all the power values corresponding to the optimal lines D1-Dn of each lead so as get the total power value of each lead, and then present the power value of the fundamental frequency and the left-to-right ratio (L/R) which is bigger or smaller than the limited value according to the space distribution of the lead;

the analysis module of the said (13)analysis on the distribution of mean power is to present the mean power value of each lead according to its space distribution;

the analysis module of the said (14)analysis on the relative value A/P and L/R of power is to calculate the front-to-rear and left-to-right ratio of the power value according to its space distribution;

the analysis module of the said (15)analysis on the curve of long temporal S pedigree is to open a window in the display interface in the form of "sub-interface in interface" for lines or pedigree selection, using fluctuation value of each pedigree or each line in each or all leads as vertical axis and time as horizontal axis;

the analysis module of the said (16)analysis on the curve of long temporal optical lines is to open a window in the display interface in the form of "sub-interface in interface" for arrangement selection of optimal lines (D1-Dn), using the frequency of the lines within the optimal line zone as the vertical axis and time as horizontal axis;

the analysis module of the said (17)analysis on the curve of long temporal fundamental pedigree is to open a window in the display interface in the form of "sub-interface in interface" for pedigree selection, using the fluctuation values in each time interval of the fundamental pedigree of all leads or each lead as vertical axis and time

as horizontal axis;

the analysis module of the said (18)analysis on the curve of long temporal space distribution of power is to open a window in the display interface in the form of "sub-interface in interface" for line selection, using the power value of each line in each lead as vertical axis and time as horizontal axis;

the analysis module of the said (19)analysis on the curve of long temporal entropy is to work out a curve using entropy of all leads or each lead as vertical axis and time as horizontal axis to present the changes of entropy along with time;

the analysis module of the said ⑳analysis on the curve of long temporal special frequency is to work out a curve using the number of special frequencies in each or all leads as vertical axis and time as horizontal axis so as to observe the changes of special frequency along with time;

the analysis module of the said (21) analysis on the curve of long temporal continuum frequency is to make out a curve using the number of continuum frequencies in each or all leads as vertical axis and time as horizontal axis so as to observe the changes of continuum frequency along with time;

the analysis module of the said (22) analysis on the curve of long temporal space distribution of fundamental pedigree is to open a window in the display interface in the form of "sub-interface in interface" for pedigree selection, using power value which is read from the single-frequency power and the distribution of its corresponding value (L/R) as vertical axis and time as horizontal axis; and

the analysis module of the said (23) analysis on the curve of long temporal conventional power spectrum is to make out n dynamic curves, separately using power values of the corresponding frequencies D1-Dn which arranged from big to small and selected from the conventional power spectrum by their biggest amplitudes selecting as vertical axis and time as horizontal axis.

18. The apparatus according to claim 15, wherein the said data in analysis module on S pedigree is transmitted to (24) distinguishing module on long temporal event mark for the distinguishing of signals in the brain wave recorder, back playing these signals in the brain wave signals and presenting them in the corresponding positions in the time axis of various dynamic curves, and wherein the analysis module on S pedigree is combined with any one or more modules of the following nine modules, including (15)analysis module on the curve of long temporal S pedigree D4ha, (16)analysis module on the curve of long temporal optical lines D4hb, (17)analysis module on the curve of long temporal fundamental pedigree D4hc, (18)analysis module on the curve of long temporal space distribution of power D4hd, (19)analysis module on the curve of long temporal entropy D4he, (20)analysis module on the curve of long temporal special frequency D4hf, (21) analysis module on the curve of long temporal continuum frequency D4hg, (22) analysis module on the curve of long temporal space distribution of fundamental pedigree D4hh, (23) analysis module on the curve of long temporal conventional power spectrum D4hi.